The CHEMIST

APRIL, 1942 VOL. XIX, No. 4

UNUSUAL INDUSTRIAL OPPORTUNITIES FOR CHEMISTS

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COMMITTEE REPORTS FOR YEAR ENDING APRIL 30, 1942

The CHEMIST

Publication of
THE AMERICAN INSTITUTE OF CHEMISTS, INC.
V. F. KIMBALL, *Editor*, 233 Broadway, New York City
VOLUME XIX APRIL, 1942 NUMBER 4

THE AMERICAN INSTITUTE OF CHEMISTS
HOWARD S. NEIMAN, *Secretary*
233 Broadway
New York, N. Y.

Entered as second class matter April 8, 1936, at the Post Office at New York, N. Y., under Act of August 24, 1912.
Issued monthly except in June, July and August at 233 Broadway, New York, N. Y.
Subscription price, $2.00 a year. Single copy, this issue $0.25

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IN THIS ISSUE

1942

STUDENT MEDALS

THE AMERICAN INSTITUTE OF CHEMISTS

"In recognition of leadership, excellence in scholarship, and character."

Washington Chapter Awards

Robert W. Alfriend, University of Virginia
Donald M. Brasted, George Washington University
Donald B. Cohen, The Catholic University of America
Charles P. Dillon, Georgetown University
Duncan MacRae, The Johns Hopkins University
Thomas H. Newby, The American University
Edward H. Price, University of Maryland
George P. Smith, Howard University

New York Chapter Awards

Robert D. Coffee, Newark College of Engineering
Martin J. Cohen, Brooklyn College
George Conto, The College of the City of New York
Arthur Gladstein, New York University at Washington Square
Kathryn J. Gunn, College of Saint Elizabeth
Patrick T. Izzo, Fordham University
Fred A. Kruger, Jr., Rutgers University
Walter Mutter, Polytechnic Institute of Brooklyn
Grace Schaffel, Queens College
Felix Wroblewski, New York University at University Heights
Bruno H. Zimm, Columbia University

Unusual Industrial Opportunities For Chemists

A symposium held by the New York Chapter, April 17th.

I

Chemical Resources of the Ocean

***By* Harden F. Taylor, F.A.I.C.**

President, The Atlantic Coast Fisheries Company

DID YOU ever wonder what would happen if you should take some of all the chemicals in a well-stocked reagent room, dump them into a great jar, dissolve them in water, stir them and let them do their worst? If you used some of all the ninety-two elements in the experiment a great many interesting things would happen and the study of many chemists would be necessary to describe the reactions and identify the products.

The world is such a huge reagent stock-room and the ocean is the jar into which all the reagents have been dumped, and are still being dumped. The reactions are occurring and all the products of the reactions are accumulating in the water and in the insoluble deposits at the bottom. So far, man has done little about the inorganic accumulations, but he is beginning to take an interest in them, and, as time goes on, deposits of valuable materials will become scarcer on land and chemists will be obliged to find ways and means of winning back from the ocean what it has taken from the land. In addition to the inorganic chemical reaction vessel, we have a great aquarium in which a vast cycle of life revolves from generation to generation producing an untold and almost unstudied assortment of chemical substances.

It ought to be interesting to have a closer look at the chemistry of the world, after which we can do a little speculating on what the practical possibilities may be for future recovery of values from the sea.

The surface of the earth measures about 197 million square miles, mostly water. Here and there is a small or sizable patch of land sticking out of the water; on these patches of land, the continent and islands,

most of the air-breathing animals have developed and now live. The ocean covers 139¼ million and the land 57⅔ million square miles, or 70.73 per cent water and 29.27 per cent land. The ocean is on the average about 2⅜ miles deep and contains 331 million cubic miles.

So far, man has got most of his needed materials from the land on which he lives. Here and there he has found veins in the rocks or rich concentrates in the sediments in the lowlands, of valuable metallic elements and compounds, as well as coal, oil, sulphur, graphite and other non-metallic elements and compounds. Of the total sunshine that arrives on the earth, about 29 per cent strikes land; of this a small amount strikes the green leaves of plants and furnishes the energy necessary for synthesis of a long chain of organic compounds beginning with simple sugars. But even this chain of reactions begins with and depends on the mineral deposits of the soil, the phosphorus, potassium, calcium, magnesium, etc., which are necessary for plant and animal life. As long as these deposits of chemical materials on and in the land hold out, man will get along, but at the rate they are going they cannot last forever—and they are going fast, to the ocean.

The land is being robbed and depleted of its chemical wealth in two ways, and, either way, in the end the ocean gets it all.

One method by which the ocean robs the land is a variety of natural processes. Water evaporates from the surface of the sea, is carried over the land where it precipitates and percolates through the soil, dissolving out the solubles. It emerges in springs and flows down creeks, rivulets and rivers to the ocean, carrying its dissolved load and its suspended sediments back to the sea, the water refluxing continously like a Soxhlet extractor. The process is assisted by various acids which aid the dissolution of minerals. Every stroke of lightning produces nitric acid which dissolves in the rain, and reacts with the soil minerals to form nitrates, all of which are readily soluble. You might be surprised at the amount of nitric acid produced by lightning. It has been estimated by a Weather Bureau physicist at twelve pounds of fixed nitrogen per acre, or 770 million tons for the whole earth, annually. Plants and parts of plants, such as decaying leaves, produce acids which also assist solution. Even carbon dioxide does its bit in transporting limestone to the sea. Water trickles into the crevices, cracks and crannies of the mountains, freezes and expands, breaking the rocks up into

bits and exposing the surfaces. They tumble down the mountain sides and are tumbled along by wind and water until they are pulverized and washed free of solubles. Glaciers rasp out of the valleys in the high mountains and in the colder climates vast quantities of material, carry it to sea where icebergs break off and drift as they melt and drop their loads. All of this has gone on throughout the ages, without the assistance of man.

But man has now taken a hand, and a reckless one, in speeding these materials along their way to the ocean. We dig the iron ore out of the ground, extract the iron, make it into cans, automobiles, bed springs, nails and a thousand other things. Most of them finish their careers on junk piles or scattered in small bits here and there to rust and dissolve, finally arriving at the ocean. So with copper, nickel, mercury, chromium, zinc and all the other metals. Coal and oil are dug out of the ground and burned, the ashes going the water route to the sea, the carbon and sulphur going into the air as oxides, and a lot of it into solution in sea water.

The Future Chemical Wealth of the World

Just as one would expect, then, the ocean has already robbed the land of a great hoard of wealth, and is continuing, with the assistance of man, with the hoarding of more and more, year by year. It is now estimated that the *dissolved* reserve of the common inorganic radicles, carbonate, sulphate, nitrate, phosphate, and the common alkalis and earths amount to 46 million billions of tons, or 4.6×10^{16} tons, and it receives new additions each year of two billions of tons of dissolved matter from the land. These figures are too large to be comprehended. Let us take just one cubic mile of sea water out of the 331 million cubic miles of the whole ocean. This one cubic mile will contain 128 million tons of sodium chloride, 18 million tons of magnesium chloride, 358,000 tons of magnesium bromide, 1,400 tons of fluorine, and so on, in solution. The deposits of the bottom contain the insoluble excesses as precipitates, probably in quantity even greater than that which is dissolved and in solution. Throughout the ages the sediments—the oxides, phosphates, carbonates, sulphates, silicates and the less soluble compounds generally, together with shells and skeletons of animals have settled to the bottom of the ocean, in places hundreds or thousands of feet in depth, packed

and solidified, and, to us here and now, hopelessly mixed and diluted, and perhaps beyond our reach.

There it is, in sea water or in the bottom sediments, the future chemical wealth of the world, the valuable mixed with, or dissolved in, the inert and valueless. It is for you younger chemists, who take up where we older ones leave off, and for the younger ones who will in time follow you as you grow older, to separate and recover the needed wealth from the sea. No one questions the abundance or identity of the ocean's wealth. The challenge is its dilution—the large amount of water or of mud that must be handled to get a little of what is wanted.

It is not the way of research to state the difficulties or describe the obstacles and let it go at that. These are the mere beginnings. We have said that in the sea the dilution or admixture of the valuable with the valueless is the difficulty. It is also the challenge to the young chemist. It is the same difficulty that confronted the mining engineer before the discovery of the flotation process of separation of small quantities of metals, sulphides, etc., from tons of dirt. Close observation of the ways of such homely things as bubbles and froth, of the competition of two liquids in wetting the surface of a solid, led to the vastly important discovery that certain highly odoriferous liquids like oil of eucalyptus added in trifling quantity to water and then mixed with the pulverized ore will cause air bubbles to stick to the wanted minerals and carry them to the top where they were skimmed off. Perhaps close observation will produce just as dramatic and just as valuable means of removing a little of wealth from a lot of ocean or bottom mud.

Recovery of Wealth from the Ocean

The ways and means may already exist. Certain living things have the ability to extract desired elements from sea water and concentrate them in their own bodies. The old way of getting iodine was to burn seaweed to ash and recover iodine from the ash. Why seaweed? Because seaweed possesses the ability to abstract iodine from sea water containing the minutest traces of it and to concentrate it several thousandfold in their own tissues. This remarkable property of collecting iodine also belongs to sponges and several other marine organisms. The blood of certain marine shellfish, molluscs and crustacea contains, as oxygen-carrying pigment, a copper compound haemocyanin instead of hemoglobin the oxygen carrier of mammals. Oysters growing in the neighborhood of old copper-sheathed ship bottoms or pilings or in

regions of rivers draining copper bearing soils, accumulate high concentrations of copper in their tissues. Other marine animals have similar affinity for arsenic. A mollusc of the south Atlantic Coast employs a manganese compound as the oxygen carrier, while vanadium serves in the sea-anemones, sea cucumbers and sea squirts. A near microscopic creature in sea water has its skeleton not of lime or silica, the common rigid structural elements, but strontia. Numerous other elements are found in living things in concentrations far in excess of that in sea water. These creatures probably employ exceedingly efficient chemical or physico-chemical methods of abstracting what they need. Can you discover what these methods are and duplicate them? Or can you discover something like flotation or foaming or perhaps methods not now even thought of that will make the wealth of sea water and sea bottom ooze accessible to man?

Much wealth has already been gained from the ocean, and recent progress in that field has been encouragingly rapid. The magnesium that is now being used to make airplanes comes, in large part, from the sea. The principle process employed depends on the insolubility of $Mg(OH)_2$, which is precipitated from sea water by calcium hydroxide. Salt has for centuries been derived from the sea, for many years of very impure grade, but now of a purity good enough for most analytical reagent purposes. Bromine is now extracted in large quantities, and incidentally iodine, directly from sea water. Other "trace" elements, boron, manganese, copper, etc., not directly extracted from sea water are nevertheless employed usefully by man in an indirect manner. Fish, shrimp wastes, etc., are dried and ground to meal used to supplement the ration of chickens and other farm animals, or else used as fertilizer. In both cases they supply the assortment of stimulating elements which seem to be necessary or advantageous to living animals.

In the organic and biochemical field, things began to happen in a really big way with the discovery of the vitamins and the development of their exploitation. Some dozen or dozen and a half vitamins are known. All of the commonly accepted ones are synthesized except A. The only important source of this vitamin is in fish liver oils. It seems highly probable that fishes do not manufacture vitamin A (or for that matter, D). Rather, they collect the carotene, which is the parent substance of vitamin A produced in plants, and convert it into vitamin A.

Vitamin A was first discovered or recognized in cod liver oil, merely because this oil had already been used as medicine for many years. Since

there are probably as many as 25,000 distinct species of fishes in the ocean, it would be a singular thing if only one fish, the codfish, had vitamins A and D in its liver. At first, however, during the late '20's no convenient means was available for detecting and measuring the vitamin content of fish liver oils. The old rat biological assay required several weeks for one assay and the result besides being very expensive was grossly inaccurate. When methods were developed for quickly and accurately measuring vitamin A, knowledge of its prevalence and distribution in the liver oils of many fishes throughout the world rapidly accumulated. These methods were at first chemical and colorimetric, such as the antimony trichloride reaction in a colorimeter, later spectrographic. The spectrograph methods of which several good variations are available, are rapid, accurate and inexpensive. With the aid of these analytical methods, hundreds, or perhaps thousands of fishes have been examined for vitamin A. No single species of fish has ever been found which does not contain it, and the codfish is near the bottom of potency per gram. However, cod liver oil is still a very great source because of the great total volume of the oil.

In the surveys of fishes for vitamins, we have not found any absolute rule which would enable us to predict in which species of fishes vitamins will be abundant, but we do have some rough rules of thumb that are useful. We know that sharks and sturgeons will have no D to speak of; that D at high levels of potency are mainly in the tunas, of which there are a dozen or so species; that old and big fishes are likely to contain more potent oil than young or little ones and other such guiding rules.

With these developments, employment opportunities have opened up for a good many chemists within the past ten years. Probably as much as five million dollars are invested in machinery for producing, extracting, refining, concentrating, etc., the vitamin oils from fishes, and new developments are still in progress or to be expected. A corresponding need has grown up for graduate chemists, chemical engineers and for junior technicians.

The end of a war usually signalizes the beginning of a new era. Men and women who have been jolted by war out of the usual peacetime routine must fall back into peace activities when peace is restored. War has brought out in embryonic form the processes and products of the next period of peace. Who is to say now how far OCEAN CHEMISTRY will go in the next period of peace?

II

Some Untouched Fields for Chemists

By **John W. Robertson, F.A.I.C.**

Chemical Director, International Tailoring Company

IT SEEMS to me that it is important to bring to the attention of the new graduates who are preparing to enter the field of chemistry as a profession some of the possibilities in this profession which have not yet been entered into appreciably. It is the hope of this paper to point out a few things concerning the chemical industry which may be of some help to them and particularly so, if they are not sure of the exact nature of the work in the industry which they would most like to do.

As my work is connected with the tailoring business, which seems to be a new industry for the entry of chemical research, I was asked to discuss some of these newer opportunities and I hope that I may do so without venturing too far into fields in which a great deal of development work has been done.

Before attempting to discuss these particular fields of endeavor, it seems to be desirable for the benefit of the students and more recent graduates to draw some sort of an outline of the various types of work which may be encountered, and to mention a few of the requirements for these types of work. This will probably be unnecessary for those who have found their places and for those who are sure of the exact work which they would like to do, but it may possibly be of some help to those who are still wondering what the chemical business is like. Sometimes these decisions are made while in school and other times they are made years later.

It is my belief that the general trend of graduates in the chemical field, until recent years, has been to enter one of the larger chemical manufacturing companies such as duPont, American Cyanamid, Monsanto, Dow, etc., and other such companies which are primarily manufacturers of chemicals by conversion of available raw materials to other pure chemicals more valuable in our economic life. These might be regarded as the manufacturers in the chemical industry who are concerned mainly with so-called "pure chemistry". Here lies the opportunity for the pure research mind, the chemical control and analytical type and the plant production or organizer type. In such an industry the chemists and engineers rule in large part its technical and business policies.

A little further down the "chemical tree" there are other industries which use some of the products of the pure chemical industry, but in relatively small quantities compared to their main items of production. These companies usually produce semi-finished products which need to be further fabricated before being economically useful. Here is the first impact of the chemist's methods and chemicals used versus the practical men of the industry which is usually an older industry, and is usually dominated by men who are not technically trained and chemical development and control has been a minor item, especially in the days when competition was slight and profits high.

In these industries the first requirement of the chemist is to be a good politician as well as to have the technical requirements of his position, and these technical requirements usually involve a broad viewpoint on the control and research and a recognition of factors which the industry has not yet recognized. Examples may include some of the older textile mills making semi-finished products, storage battery manufacturers, paint manufacturers and leather manufacturers a little before the present technical growth of these industries. Large chemical manufacturing companies usually instituted development in these industries themselves in order to expand the markets for their products. There is still a large field for chemical development in these companies manufacturing semi-finished products.

Chemical Products for Specialty Fields

Coincident with some technical development in the above group, there have developed the "specialty manufacturers" who have concentrated on the development of compositions which could be used in numerous industries which they serviced, without particular technical help or experience. As technical development proceeds in those industries making semi-finished products they will, no doubt, themselves assume much of the work of the "specialty manufacturers". But at any rate, it is still a good field, for specialty products are marketed in large variety and tonnage. A very wide range of knowledge of chemicals and their uses and effects on the various products and processes with which they are designed to be used is needed.

As we explore still further the fields in which chemists may, in the future, find some of their greatest usefulness, we go into the manufacture of fabricated products which go directly to the ultimate consumer in the form in which they are manufactured. It would seem to me that

in this field are offered some of the greatest opportunities and it is also here that the requirements are still further expanded and there is a need for pure research and for the development of compositions for certain specialty operations which must be tailored very carefully in the close coöperation with the mechanical manufacturing operations in order to accomplish a specific purpose. A great deal of imagination and adaptability, as well as technical ability, is required in these fields. The volume of chemicals as such which may be involved is likely to be relatively smaller than any other of the industries already mentioned, because the primary object is for improvement of the product or reduction of costs and this may involve the use of very small quantities of chemical materials. This is probably the basic reason that "specialty manufacturers" and others have not yet entered very heavily into such industries. The research required, the difficulties of evaluating their products and the low volume of expected sales do not offer much encouragement, except in the case of the fabricator who wishes to do his own development work.

For instances of this kind, I think we may go back to the soil and start with the farm. While a great deal is being done in the development of uses for farm products, I do not believe that a great deal has been done yet in the development of production methods for the farmer. This development appears to have started in the far west but has not yet reached very great proportions.

In the manufacture of furniture also, we find that some work has again been done by chemical manufacturers who furnish materials to the industry but little has been done by the industry itself to develop products which are even more adapted to their uses and to the improvement of the processes. It seems logical that even the large contractors who build all types of structures would find it profitable, over a period of time, to carry on more development work in coöperation with the large chemical manufacturers who are endeavoring, at more or less long range, to furnish them with improved products and processes.

Chemists in the Tailoring Industry

Many people have asked why there should be a place for a chemist in the tailoring industry and I will try to answer some of those questions, although most of the work and the plans for our research are so new that a great deal of it cannot be told. But there are a number of things which probably will be apparent if I mention a few of the more obvious possibilities. Special adhesives might be mentioned as one field in

which we are very interested and in solving some of the problems we find it valuable to know a great deal about the properties of all the synthetic resins, as well as the various compositions which have been used for years as adhesives. It is extremely important, for instance, to have a carefully tailored adhesive for putting a few million samples into sample books so that they do not come loose and so that they maintain their natural appearance. We have also found that in certain constructions we may, with a thermo plastic adhesive coating if it is applied just at the right place and in the right manner, hold a seam or other piece of fabrication in an exact position. In this case we want an adhesive that sticks and does not come out in normal wear and dry cleaning.

One of the slow operations in garment manufacture is a temporary sewing or basting and here we want adhesives which according to the adhesive manufacturer doesn't stick, i. e., they should be just adhesive enough under manufacturing conditions but be completely non-adhesive and non-obvious at the end of construction. We still think that there is room for improvement in design and methods of fastening buttons, and in materials to make them, in spite of the fact that there are several thousand patents in this field.

There is a great deal yet to be done in the way of finishes to improve the "hand" of a fabric and perhaps to make it more waterproof and fireproof. Developments along these lines may come more quickly when large amounts of synthetics are being used along with the wool; and to bring this up to date, I might mention that we had to stop some of our other work to develop a new finish for pants' bottoms so that the elimination of the cuff would not cause too great a disturbance in the appearance or drape of the bottom of the pants' legs.

As has been pointed out earlier these problems may appear to be minor, and I assure you there are plenty more of them, but they can be of appreciable economic value when suits are made at the rate of hundreds of thousands every year.

Pure Research Opportunities

It may seem that pure research for the sake of pure research has been somewhat slighted. I would like to mention, in closing, that the development of aromatic chemistry has been very important over a period of quite a few years, a major development in aliphatic chemistry is now

under way and offers plenty of room for the imaginative; and while those two fields of carbon chemistry are very broad, it is best to imagine some parallel type of development in silicon chemistry over a period of years in which the element silicon could conceivably be the nucleus of the molecule instead of carbon. In a profession where anything can happen and usually does, there will always be plenty of room for the growth of any individual who wants to go into it.

III

Utilization of Wood Wastes

***By* Raphael Katzen**

Northwood Lignin Fellow, Brooklyn Polytechnic Institute

WOOD is not commonly recognized as one of our major industrial raw materials and sources of energy. Although originally utilized as a fuel, wood has passed through a cycle, next as a building material, then a chemical raw material, and is now again being applied as a fuel in internal combustion engines—via the producer gas process. Based on photosynthetic reactions utilizing only 0.5—1 per cent of the solar energy available, the wood grown annually per acre is equivalent to 3000 pounds of coal as a fuel, a total annual growth far surpassing our fuel requirements.

Lignin, the relatively unknown component of wood, has been described as an "illusion" by one research worker in the field. He claims that lignin does not exist as such, but is formed by degradation of carbohydrate matter during chemical treatment used to isolate lignin. Be that as it may, the fact remains that about 1,500,000 tons of this "illusion" pass to waste annually, from pulping operations, through our streams. Additional tens of millions of tons go to waste by rotting and burning, in attempts to dispose of materials remaining after logging and sawmill operations. In this latter case, the cellulose present in conjunction with the lignin increases the waste three or fourfold.

Chemical operations based on the utilization of wood have been relatively inefficient in the past. Recoverable and saleable products for several processes in terms of the dry wood treated are:

Wood distillation	40 per cent
Pulping processes	40 to 50 per cent
Rosin extraction	20 per cent
Tanning extracts	5 to 10 per cent
Hydrolysis, for plastics	60—70 per cent
Hydrolysis, for alcohol	30 per cent

Newer processes, such as the caustic fusion operation, yield products accounting for eighty to ninety per cent of the wood; and a new pulping process developed at the Polytechnic by the author yields cellulose plus lignin derivatives which account for ninety per cent, or even more, of the wood treated.

Current research of the type mentioned above is achieving improved utilization of wood by applying recently-acquired knowledge concerning the structure and reactions of cellulose and lignin. In the latter case particularly, the theories developed are in a great state of flux, and further research on a large scale is envisaged before we can utilize this practically unlimited raw material to the greatest advantage.

Charles R. Hoover

The American Institute of Chemists records with deep regret the untimely death of Charles R. Hoover who perished in the collision of two Navy training blimps off the coast of Manasquan, N. J. on June 8, 1942. Details of the secret test flight of the Navy blimps were refused for war reasons by the Naval Air Training Station. Dr. Frank Aydelotte, of the Office of Scientific Research and Development, Washington, D. C., made the following comment on the loss of the twelve navy and civilian passengers, "these men lost their lives in an accident encountered in an experimental flight in connection with important scientific war research, and gave their lives for their country as truly as any soldier or sailor killed in battle".

Dr. Hoover was born September 30, 1885, in Oskaloosa, Iowa. He received the Ph.B. degree from Pennsylvania College, the B.S. degree from Haverford College, the M.A. degree from Haverford College,

and the Ph.D. degree from Harvard University. From 1910 to 1918, he taught at Pennsylvania College, Harvard University, Syracuse University and Wesleyan University. In 1918 he was appointed professor of chemistry at Wesleyan University where he remained until recently when he engaged in Navy research.

Dr. Hoover also served as a consulting chemist and chemical engineer to the Connecticut State Water Commission and the Connecticut State Fisheries and Game Commission. He did much research on problems concerned with industrial waste, the catalytic synthesis of unsaturated hydrocarbons; and the catalytic pyrolysis of hydrocarbons in the presence of carbon monoxide. He also designed and constructed laboratory equipment. Among his published works are two laboratory manuals, articles in technical magazines on the "Atomic Weight of Iron", methods of testing gasolines, the construction and equipment of chemical laboratories, and miscellaneous reports on trade waste disposal.

Dr. Hoover became a member of THE AMERICAN INSTITUTE OF CHEMISTS in 1933.

Robert L. Perkins

THE AMERICAN INSTITUTE OF CHEMISTS records with sincere regret the death of Robert L. Perkins, F.A.I.C., who had been active until the time of his decease as a research group leader, for the National Aniline and Chemical Company, Buffalo, N. Y.

Robert Loyal Perkins was born on June 5, 1890, in the state of Michigan. He received the degree of Ph.C. in 1914 from Valparaiso University, and the degrees of B. S. and M.S. from the University of Michigan in the years 1915 and 1916, respectively.

Mr. Perkins began his career in 1916 to 1918 with Parke Davis and Company, Detroit, Michigan, where he did miscellaneous work as a research chemist. He became affiliated with the National Aniline and Chemical Company in 1918 where he remained up until the time of his death. His work with this company was mostly concerned with basic colors and intermediates, sulphur colors, and sulphur colors and thioindigos, during his variously held positions as plant chemist, research chemist, and research group leader.

Among the publications of Robert L. Perkins was "The Determination of Alcohol and Waters in Ether for Anaesthesia" in *The Journal*

of Industrial and Engineering Chemistry. Mr. Perkins also held various chemical patents.

Besides his vocational interests in the field of chemistry, he was deeply interested in music during his lifetime, and belonged to the East Aurora Society of Artists and The East Aurora Orchestral society. He was a member of the American Chemical Society. He became a member of THE AMERICAN INSTITUTE OF CHEMISTS in 1932.

Harry Nortine

THE AMERICAN INSTITUTE OF CHEMISTS records with deep regret the death of Harry Nortine, who was a student medalist of the Pennsylvania Chapter, in 1940, from the University of Pennsylvania. His death occured on February fourteenth following a nervous collapse which he suffered in November.

Mr. Nortine was born in New York, N. Y. on October 2, 1917. He attended public school and high school in Philadelphia, and for exceptionally high standing he was awarded a four-year scholarship to the University of Pennsylvania. There he received the A.M. degree after only four years of work. He then attended the University of Pennsylvania Medical School where he was studying at the time of his illness. Throughout his scholastic career he received awards and prizes for excellence in his studies. At the same time, he was proficient in sports, especially swimming. He worked during the summers at the sea shore, and he was especially adept at making boat models.

Mr. Nortine showed promise of a particularly brilliant career in chemistry, and it is to be regretted that his death occurred when he was but twenty-four years old.

COUNCIL

April Meeting

The 189th meeting of the National Council of The American Institute of Chemists was held on Tuesday, April 14, 1942, at The Chemists' Club, 52 East 41st Street, New York, N. Y., at 6:30 p.m.

Dr. Harry L. Fisher presided. The following officers and councilors were present: Messrs: E. R. Allen, S. R. Brinkley, H. L. Fisher, C. N. Frey, M. L. Hamlin, R. J. Moore, W. J. Murphy, H. S. Neiman, F. D. Snell and W. D. Turner. Miss V. F. Kimball was present.

The minutes of the preceding meeting were approved.

A letter from Robert S. Casey, F.A.I.C., with ideas for obtaining new members, was read.

President Fisher read a letter from Dr. Read, which contained constructive suggestions for the Institute.

The professional status of chemists, with relation to the importance of licensing, was discussed. The need for a definition of "chemist" was also brought out, and means for additional publicity for the Institute's work were discussed.

Upon motion made and seconded, C. Morris Johnson was reinstated to Fellow membership in the Institute.

The Chairman of the Committee on Annual Meeting Arrangements reported progress, and outlined the program.

There being no further business, adjournment was taken.

Applications for Membership

Final action will be taken by the National Council, at its next meeting, on the following applications:

For Fellows

Ducca, Frederick W.
Chemist, The Bakelite Corporation, Bloomfield, N. J.

Fulton, Ralph G.
Development Chemist, The Bakelite Corporation, Bloomfield, N. J.

Hanson, Norman D.
Chemist, Bakelite Corporation, Bloomfield, N. J.

Mackinney, Herbert W.
Research Chemist, The Bakelite Corporation, Bloomfield, N.J.

Rice, Oscar K.
Associate Professor of Chemistry, University of North Carolina, Chapel Hill, N. C.

Richardson, Stanley H.
Chemist, Bakelite Corporation, Bloomfield, N. J.

Schaad, Raymond E.
Research Chemist, Universal Oil Products Company, Chicago, Illinois.

Thompson, Frederick B., Jr.
1*st Lieutenant,* Sanitary Corps, U.S.A. 1037 Lucile Avenue, Atlanta, Georgia.

For Associates

Bourland, James F.
Research Chemist, Calco Chemical Division of American Cyanamid Company, Bound Brook, N. J.

Dhein, Leonard H.
Research Chemist, Calco Chemical Division of American Cyanamid Company, Bound Brook, N. J.

Ebel, Robert H.
Research Chemist, Calco Chemical Division of American Cyanamid Company, Bound Brook, N. J.

Garty, Kenneth T.
Research Chemist, The Bakelite Corporation, Bloomfield, N. J.

Granis, Michael
Research Chemist, Calco Chemical Division of American Cyanamid Company, Bound Brook, N. J.

Kertesz, Dennis J.
Research Chemist, Calco Chemical Division of American Cyanamid Company, Bound Brook, N. J.

Meunier, Alfred C.
Research Chemist, Calco Chemical Division of American Cyanamid Company, Bound Brook, N. J.

Nield, Cyril H.
Research Chemist, Calco Chemical Division of American Cyanamid Company, Bound Brook, N. J.

Pitt, Charles F. III
Chemist, The Bakelite Corporation, Bloomfield, N. J.

Walters, Linwood A.
Chemist, The Bakelite Corporation, Bloomfield, N. J.

White, Abner
Administrative Officer, Johnson and Johnson Gas Mask Division, Chicago Chemical Warfare Procurement District, Chicago, Illinois.

For Juniors

Alexander, Mary L.
Librarian, Universal Oil Products Company, Chicago, Illinois.

Anderson, Eleanor G.
Library Research, Universal Oil Products Company, Chicago, Illinois.

Covet, Sylvia
In Patent Department, Universal Oil Products Company, Chicago, Illinois.

For Reinstatement to Fellow

Bullock, Edmund R.
Research Chemist, Eastman Kodak Company, Rochester, New York.

Phillips, E. B.
Chief Chemist, Sinclair Refining Company, Chicago, Illinois.

CHAPTERS

New York

Chairman, Elmore H. Northey *Vice-chairman,* Paul J. Witte

Secretary-treasurer, A. Lloyd Taylor

Oakite Products Company, 22 Thames Street

New York, N. Y.

Council Representative, Marston L. Hamlin

Niagara

Chairman, L. M. Lawton

Vice-Chairman, George W. Fiero

Secretary, Margaret C. Swisher

Department of Chemistry

University of Buffalo

Buffalo, New York

Council Representative, Arthur W. Burwell

Carl H. Rasch, *Alternate*

Pennsylvania

Chairman, J. M. McIlvain *Vice-chairman,* Maurice L. Moore

Secretary-treasurer, Clinton W. MacMullen

Rohm and Haas Company

Philadelphia, Penna.

Council Representative, Gilbert E. Seil

News Reporter to THE CHEMIST, Kenneth A. Shull

Washington

President, L. F. Rader, Jr.

Vice-president, Donald H. Andrews *Treasurer,* L. R. Heiss

Secretary, Ernest J. Umberger

207 Albany Avenue, Takoma Park, Maryland

News Reporter to THE CHEMIST, T. H. Tremearne

Council Representative, Albin H. Warth

The American Institute of Chemists
Committee Reports
For the Year Ending April 30, 1942

Report of the Secretary
For the Year Ending April 30, 1942

I am pleased to submit this report of the activities of THE AMERICAN INSTITUTE OF CHEMISTS during the season 1941-42.

The National Council held twelve meetings during the year with an average attendance of twelve officers and councilors.

The following actions upon membership were taken:

Elections

Fellows	50
Associates	10
Juniors	24
	84
Reinstated to Fellow membership	2
Reinstated to Junior membership	1
Total	87

Loss of Membership

Resignations

Fellows	47
Associates	3
Juniors	11
Total	61

Deceased

Fellows	11
Total Loss of Membership	72
Total Increase of Membership	87
Total Decrease in Membership	72
Net Increase in Membership	15

Actions

Associates to Fellows	6
Juniors to Fellows	1
Juniors to Associates	3
Students to Juniors	2

Membership

	May 1941	May 1942
Honorary Members	5	5
Life Members	9	9
Fellows	1350	1351
Associates	100	104
Juniors	186	198
Students	9	7
	1659	1674

Necrology

I regret to make note of the following deaths during the season:

Fellows

Frank Julian Andress
A. Richard Bliss, Jr.
L. B. Cross
Raymond Freas
D. D. Jackson
Carl O. Johns
Alexander Lowy
Joseph L. McEwen
Hal W. Moseley
Robert E. Rauh
Emil Schlichting
Wilhelm Segerblom

The increase in membership is only five less than that of last year, and the present membership is the largest in the history of the Institute. This increase in evidence that, notwithstanding the present war emergency, the interest in the Institute upon the part of its members as well as upon the part of non-member chemists has not abated, a most encouraging sign for its future growth and for its recognized value to chemists and to the chemical profession.

The increased activities of the various committees, as presented in their various reports, have thrown an additional burden upon the Secretary's office, and the amount of correspondence and clerical work has been greater than in any of the past years.

The Institute was represented at the Exposition of Chemical Industries held in New York in December, by a booth, which was faithfully attended by members of the New York Chapter. Special leaflets were prepared for distribution to those who were interested in the work of the Institute.

I again wish to express my deep appreciation to my assistant, Miss. V. F. Kimball, for her valuable, loyal, and conscientious service to me as secretary, which with her capable and successful management of THE CHEMIST, as its editor, deserve the highest commendation of the members of the Institute.

Howard S. Neiman, Secretary.

Report of the Auditor

The American Institute of Chemists,
Gentlemen:

Pursuant to your instructions, I have audited your books and records for the fiscal year ended April 30, 1942 and submit herewith a statement of assets and liabilities as at that date, together with a statement of income and expenses for the year and a statement of cash receipts and disbursements.

Cash in the Public National Bank was verified with the monthly bank statements and satisfactory vouchers were presented for all items under audit.

There was invested the sum of $1480.00 in defense bonds. Because of the fact that over $4000.00 is set aside in savings bank and investment in bonds, it was found necessary to borrow $1000.00 from the Public National Bank in order to meet operating expenses for the balance of the fiscal year ended April 30, 1942. Dues receivable from members for the current and prior years amounted to $3740.00 against which there was provided an arbitrary reserve of 50 per cent. for delinquent accounts.

The excess of income over expenses amounted to $134.41, and compares with $569.82 for the previous year. Included in net income is an amount of $98.41 which represents the net profit on the publication of THE CHEMIST.

The surplus account on April 30, 1942 was $5443.70 and represents an increase of $134.41 for the year. Your total membership increased from 1655 on April 30, 1941 to 1673 on April 30, 1942 as indicated by the schedule of membership changes.

I hereby certify that in my opinion, the balance sheet submitted herewith, and the related statements of income and expenses, correctly present the financial position of THE AMERICAN INSTITUTE OF CHEMISTS on April 30, 1942, and are in accordance with the books and records.

Respectfully yours,
(signed) Jacob A. Lichtenfeld,
Certified Public Accountant.

SCHEDULE OF INCOME AND EXPENSES

FOR THE YEAR ENDED APRIL 30, 1942

American Institute of Chemists

Income			
Members Dues, 1941-42		$6,637.95	
Less Reserve for Chapter Refunds		479.55	
Net Income from Dues		$6,158.40	
The Chemist Publication			
Income from Advertising	$ 648.00		
Income from Subscriptions	2,638.49		
Gross Income	$3,286.49		
Less Cost of Publication	3,188.08		
Net Income from THE CHEMIST		98.41	
Total Gross Income for the Year			$6,256.81
Expenses			
Salaries		$3,044.00	
Stationery and Printing		326.68	
Secretary Expenses		41.15	
Social Security Taxes		28.44	
Interest on Bank Loan		18.34	
Membership Expenses		254.38	
Telephone and Telegraph		111.26	
Postage		387.00	
Rent and Light		627.64	
Council Meeting Expenses		114.55	
Annual Meeting Expenses		297.13	
Accounting		125.00	
Occupancy Tax		1.00	
Safe Deposit Box		8.33	
Christmas Gifts		10.00	
Chemist Advisory Council Contribution		675.00	
Chemist's Show		40.00	
Treasurer's Bond		12.50	
Total Expenses for the Year			$6,122.40
NET INCOME FOR YEAR ENDED APRIL 30, 1942			$ 134.41

Jacob A. Lichtenfeld,
Certified Public Accountant.

Report of the Committe on Professional Education

1941-1942

Because of the extra duties imposed on many of the members of the Committee by the war effort, it has not seemed feasible to hold a meeting of the Committee during the past year, and business has been transacted by correspondence. The Chairman of the Committee has read two papers on problems involved in the education of the professional chemist, one at the Annual Meeting of the Institute last year in Washington and one at a meeting of the New York Chapter in November. Digests of these papers have been published in THE CHEMIST.

As a result of these publications an editorial appeared in *The New York Times,* November 24, 1941, commenting on the need of activity by the various professional societies in meeting the demand for technically skilled men for the war efforts. A number of inquiries have been received, particularly questions about the possibility of any concrete steps.

According to reports received, a number of the societies representing various fields of science and industry are taking informal steps to determine the possibility and the desirability of government subsidy for scientific education. It is the intention of the Committee to keep in as close touch as possible with the developments in this direction and to inform the Council of the Institute whenever any action on our part seems desirable.

The Committee is of the opinion that acceleration in the training of chemists is desirable and that every member of the Institute should be urged to coöperate toward this end. It is of the further opinion that every effort should be made to insure that the accelerated training is basic. Any program which will produce half-trained chemists may raise a serious problem of employment when the war is over and should be avoided as far as possible.

Respectfully submitted,

Addison C. Angus
Ross A. Baker
B. S. Hopkins
J. Fitch King
Foster Dee Snell
Donald H. Andrews, Chairman.

Report of the Committee on Ethics

1941-1942

Your Committee has had for consideration in the past year the matters of two members of the Institute who were publicly charged with violations of the ethical standards of the Institute.

In these cases your Committee has examined copious files of data and reports, and received statements from various individuals, and have prepared and reported their findings. The results are embodied in reports submitted to the Council.

Copies of these reports are attached to the minutes of January 6 and February 17.

Respectfully submitted,

W. D. Turner, Chairman.

Report of the Committe on Professional Status

1941-1942

This committee, consisting of Messrs. W. H. Gardner, E. R. Allen, F. G. Breyer, C. N. Frey, and D. Price, has made a very detailed study during the year of how the professional status of chemists might be both enhanced and strengthened.

Survey Undertaken

The Committee met twice with Mr. Lawrence Hunt, a leading attorney on labor relations of the firm of Hurd, Hamlin and Hubbell, to survey what might be done from a legal aspect. These meetings took place on November fifth and twelfth. During the month of December, the Committee then met twice with representatives of the leading chemical societies and discussed a possible cooperative program for the promotion of the professional status of chemists. Mr. Hunt was present at both of these meetings and took an active interest in the proceedings. The national officers were also present. This was followed on January thirteenth by a meeting with delegates of the leading engineering and other professional societies to discuss the licensing of chemists in its broadest aspects and the experience of the societies represented in obtaining licensure. In addition, the individual members reviewed numerous articles which have been published upon this general subject. An effort is being made to compile a complete bibliography which it is hoped will be made available to all members. Members have also taken an active part in discussing this subject with members of the individual chapters.

Professional Needs

This study on the part of this Committee has revealed that the following are critically needed for effective promotion of the professional status of chemists:

1. An intersociety council of professional chemical and chemical engineering groups.
2. A legal advisor active professionally in the field of labor relations.
3. An employment agency.
4. A full time paid representative to look after the interests of the profession.
5. Universal licensing of chemists by various states.
6. Uniform definitions of a chemist, and of the various sub-professional groups of workers in the chemical fields.
7. A vigorous educational program to awaken in chemists the fullest of professional consciousness and to point out that such exists to those who hope to undertake such a career.
8. A revision of employment contracts to clearly recognize the professional status of chemists and to protect the chemist from the encroachment of unionization against his will.
9. A uniform code of ethics for all chemists and chemical engineers.
10. An agreement among leading chemical groups as to the advantages to be offered in undertaking a career as a chemist and an active campaign to bring this to the attention of prospective students of chemistry.
11. Publicity upon importance of professional status of chemists to the public weal.

Means of Accomplishing Objectives

At a meeting of official delegates of the American Institute of Chemical Engineers, Association of Consulting Chemists and Chemical Engineers, and

THE AMERICAN INSTITUTE OF CHEMISTS, in February, it was generally agreed that an inter-society council for the promotion of the professional status of chemist was most desirable. Such a body could serve as a continuous meeting ground for those actively engaged in this phase of our work. This council could also serve as a means for coördinating the efforts of the member groups in this field. It was the consensus of opinion of the delegates that most of the points listed above could be accomplished by joint-effort of the member groups through such a council provided with sufficient funds for such a purpose. However, to undertake any part of such a program at the present time would unquestionably require an increase in dues on the part of each of the professional societies represented in such a council. The type of council discussed could well be modeled upon the Engineering Council for Professional Development, since the E.C.P.D. was founded and is supported by the Professional Engineering Societies for a very similar purpose.

Much could undoubtedly be accomplished of an immediate nature, if we had the services of a suitable legal counselor upon labor relations. The professional advice of such an attorney, however, is most expensive. Unless he is a specialist in the labor field, it would be money poorly spent since the legal aspects of labor relations are now changing daily and must be followed closely by one well-known and actively engaged in this phase of the legal profession.

There was never a greater need than at the present for an employment agency run by the professional chemical societies. If such existed, it could be of inestimable service to our country during this period of greatest shortage of experienced chemists. The services which such an agency can render following the period of national strife are inestimable. It was most unfortunate that ways could not be found to actively continue the Chemist Advisory Council this year. This makes it even more imperative that every means should be sought to establish as early as possible a bureau which could serve both in advisory and employment capacity.

We also have an ever increasing need for a full-time, paid professional representative to look after the many needs of the profession. Such an individual should be capable of handling publicity, following legislation affecting chemists, promoting licensure, striving to increase membership, and organizing the educational program mentioned above. Our failure actively to promote licensure this year was as much due to the lack of having such an individual, as to the unfortunate series of circumstances which prevented the reintroduction of the bill in the New York Legislature. Such an individual should be well-versed in chemistry, widely acquainted with men in chemical industries and one who has had executive experience, preferably in a technical or semi-technical field.

The need for other items listed are self-evident. They have been discussed frequently in the councils of this society and hence they need but be listed in this report, as has been done above.

Recommendations

Probably the most forward step the Institute could take at this time would be to find means for supporting a full-time, paid representative of the type described above, who could devote his entire efforts to the interests of the Institute. This would probably do more than anything else to bring to pass the

completion of the program as outlined.

By a limited increase in dues, and a complete reorganization of the budget, there is little question but that sufficient funds could be made available for hiring such an individual. Undoubtedly the services of the right individual for this work should be obtained even during this pressing period.

Respectfully submitted,
W. H. Gardner, Chairman.

Report of the Committee on Economic Welfare
1941-1942

The Committee on Economic Welfare of the Chemist met at the Chemists' Club on Monday evening, December 1st. Unfortunately, most of the members failed to appear, due to unavoidable delays.

I had a discussion with Larry Bass, Chairman of the American Chemical Society Committee on the Economic Status of the Chemist, concerning his plans. I told him that we had a Committee on Professional Status as well as a Committee on Economic Welfare, and both Committees were doing work which might eventually be of interest to the Chemical Society. I suggested that our Committee would undoubtedly be willing to work with his Committee in a coöperative manner, provided they felt that our group would be of assistance to them. While I could not speak for the Committee at this time, I felt there would be no difficulty in making an arrangement to work together. Dr. Bass stated that their plans were still undecided but they would meet on Tuesday, December 2nd, and at that time the entire program would be discussed. They had already coöperated with the Department of Labor on a survey and they felt that this was a good beginning. He felt that he could discuss this matter more fully after the Committee meeting and would get in touch with me following the meeting of his Committee.

Our Committee, after considerable discussion, decided that there was very little that we could do this time, except to offer our services to Dr. Bass' Committee with the suggestion that we would be glad to aid them in their work.

Possibly the best contribution we could make would be to offer to collect information from various professional groups, such as the AMERICAN INSTITUTE OF CHEMISTS, Chemical Engineers, Electrical Chemical Society, Paper and Pulp, possibly the Cereal Chemists, and Food Technologists covering their status in the industry, together with a record of the training of the individual. We might also offer to do this work for the American Chemical Society because we do not feel that the present questionnaire is a satisfactory one. Our questionnaire would require a different arrangement from that sent out by the Chemical Society. In other words, we would have to start over again with a new survey. It is believed that this would be an advantage because under the present conditions the Labor Department has information on the Chemical Society as well as on the non-members of the Society and just what this information means in the hands of the various interpreters remains to be determined.

It is also suggested that we take no action in respect to the development of an Economic Survey through the Russell Sage Foundation or any other foundation until we know more about the attitude of the American Chemical

Society. Possibly they have plans for such a Survey and in that case it would be useless to duplicate their work.

When the report of the American Chemical Society is available in printed form, it is suggested that a study be made by the Committee on Economic Welfare.

The Chairman wishes to thank Dr. Shepard and Mr. Bhagwat for their contributions.

Respectfully submitted,
Charles N. Frey, Chairman.

Report of the Editor of The Chemist

THE CHEMIST has faithfully reported the activities of the Institute and its chapters and committees during the year, together with articles on subjects of importance to the profession. This latter material has been listed in reference sources, quoted in various papers, and a large number of inquiries have been received from those who are interested in special subjects. We have received an unusually large number of subscriptions to THE CHEMIST this year from non-members of the Institute, from industrial libraries, and from those who are interested in the professional aspects of chemistry. The cash income from subscriptions this year was increased by more than ten per cent over that of last year.

Paper, printing, and photo-engraving costs have advanced sharply, and it is difficult to obtain cover papers because of the new rigid specifications as to weights and colors which may be issued by the manufacturers. In spite of these difficulties, THE CHEMIST managed to stay within its budget with a balance of about $90.00, which was due to the increase in subscriptions, and to careful economy.

In accordance with the new censorship regulations, material printed in THE CHEMIST is subject to censorship, particularly in the case of copies exported to other countries. A license must now be obtained for each copy exported.

THE CHEMIST has handled quite a large number of orders for books and is glad to be of service to our members by obtaining books for them.

We are grateful for the splendid coöperation which has been shown by the news reporters and chairmen of the various chapters, and by the contributing editors; for the encouragement and assistance given by President Fisher and the members of the Council; and for the kind guidance and help of Secretary Neiman.

Respectfully submitted,
V. F. Kimball, Editor.

Report of the Committee on Unemployment

Your Committee held no meetings during the current year. The pressure of work on everyone has been such that your Chairman felt that no time should be consumed on any activities that are other than extremely urgent or important. Actually the need for activities by an Unemployment Committe have not existed during the past year. This is illustrated for example by the discontinuance of the Chemist Advisory Council.

Respectfully submitted,
E. R. Allen, Chairman.

Report of the Membership Committee 1941-1942

The Membership Committee of the Institute was organized in the Fall of 1941 with representatives from different sections of the country, each of whom was chairman of a regional committee, to carry on an extensive study of the professional and welfare problems of chemists by means of group meetings and conferences. The growth in membership of the Institute was viewed as incidental to the greater task of formulating the objectives of the Institute and setting up definite projects which the organization might undertake.

The national emergency has so occupied the time and attention of the active leaders of the Institute that this plan has been laid aside for the time being.

However, your Committee would recommend that this work which has been outlined be taken up as soon as practicable, so that when general reorganization comes with the end of the present conflict the Institute will be in a position to render service in many ways to the chemical profession.

Respectfully submitted,
W. T. Read, Chairman.

Report of the Inter-Relations Committee 1941-1942

The Inter-Relations Committee of the Institute was set up in 1939 to consider questions of dissatisfaction among the membership.

During its first two years the Committee investigated such questions and submitted two reports on its findings and recommendations.

This work was finished last year, but the President continued the Committee in existence in the event that other matters might be referred to it.

Since no new matters came up requiring its attention, the Committee recommends its own discontinuance.

Respectfully submitted,
Charles A. Marlies, Chairman.

Report of the New York Chapter 1941-1942

The New York Chapter has enjoyed a very successful year as indicated by the large attendance at its meetings, by the active work of its committees, and by the increase in membership of the Chapter.

Meetings

Four meetings have so far been held at The Chemists' Club and a final meeting is scheduled for Friday, May twenty-second.

1. On November 14, 1941, Professor Donald H. Andrews of John Hopkins University addressed the Chapter on the topic, "Educating the Chemist for National Defense". His stimulating talk provoked a lively discussion which was led by Professor Harry G. Lindwall of New York University.

A business meeting preceded Professor Andrews' address, at which the revised by-laws of the Chapter, presented on May 23, 1941, by the Committee on Revision of the Constitution and By-Laws, were unanimously approved on their first reading.

2. A testimonial dinner was tendered to National President, Dr. Harry L. Fisher, on December twelfth, at which

Professor Marston T. Bogert of Columbia University spoke in his usual entertaining style on the personal side of Dr. Fisher's life, and Dr. Norman A. Shepard of the American Cyanamid Company presented an interesting analysis of Dr. Fisher's scientific achivements. Dr. Fisher, himself, choosing as his topic, "The Personal Side of Some Rubber Inventions", gave a talk which was of interest not only to the chemists but to the numerous guests and ladies present.

Following the program, a brief business meeting was held at which the revised Constitution and By-Laws were unanimously approved. The National Council has since acted favorably upon this action taken by the Chapter, and the revised Constitution and By-Laws are consequently now in operation.

3. On Friday, February 13, 1942, an open discussion entitled, "Licensing the Chemist" was held at The Chemists' Club before a capacity audience of one hundred and fifty members and guests. Dr. Foster Dee Snell led the discussion and the following speakers, representing various branches of the profession, presented the case for licensing: Dr. William Howlett Gardner, research professor of chemical engineering, Brooklyn Polytechnic Institute; Dr. Lincoln T. Work, director of research, Metals and Thermit Corporation; Dr. Stephen L. Tyler, executive secretary, the American Institute of Chemical Engineers; and Dr. John E. Schott, research chemist Tidewater Oil Company. The discussion from the floor which followed was somewhat prolonged and many members of the Chapter participated. The consensus was that licensing of chemists in New York State ought to be pushed without further delay and a resolution was unanimously approved, "That the national representative be instructed to request the national council of The Institute to make a substantial appropriation to the New York Chapter to be used for carrying out the work necessary to obtain passage of a licensing bill by the New York Legislature."

4. A symposium entitled, "Unusual Opportunities for the Chemist", in which the following speakers took part, was held on April 17, 1942: Dr. Harden F. Taylor, president, Atlantic Coast Fisheries Company, whose topic was, "Products from the Ocean"; Mr. Raphael Katzen, Northwood Lignin Fellow, Brooklyn Polytechnic Institute, who spoke on, "Utilization of Wood Waste Products"; Mr. John W. Robertson, chemical director, International Tailoring Company, who spoke on "Some Untouched Fields." Preceding the symposium, President Harry L. Fisher presented the student medals of The Institute to eleven outstanding senior students who represented the universities and colleges of the New York Metropolitan area.

5. The final meeting of the year will be held on May twenty-second, and will begin with the Annual Business Meeting, following which Dr. J. J. Mattiello will present a program on the subject of fluorescent paints.

Committees

The Program Committee consisted of Mr. W. W. Winship, chairman; Mr. John W. Robertson, Dr. J. J. Mattiello, and Dr. F. W. Zons. The Chapter is greatly indebted to Mr. Winship and his committee for their fine work in arranging such excellent programs.

Thanks are especially due to Dr. F. W. Zons for the well-prepared and clearly printed announcements of the meetings, and to Mr. John W. Robertson for arranging the Symposium on "Unusual Opportunities for the Chemist."

The Committee on Professional Problems, consisting of Mr. H. F. Wakefield, chairman; Mr. M. R. Bhagwat, and Dr. R. R. Denslow, had relatively few functions to perform during the past year because of the fact that the National Council appointed a special committee on Professional Status, which was very active and of which your chairman was a member. Mr. Wakefield's committee merits the thanks to the Chapter for its assistance in arranging the Symposium on Licensing.

The Membership Committee consisted of Dr. A. Lloyd Taylor, chairman; Dr. F. H. Adams, Mr. Lloyd W. Davis, Dr. Paul J. Witte, Dr. Karl T. Steik, and Dr. William H. Gardner. It was thought undesirable to carry out a membership drive in the Institute, but without doing so this committee has done excellent work in bringing a number of highly desirable new members into the Chapter solely by personal contacts. Mr. Lloyd W. Davis is to be especially congratulated for his work in this connection.

Chapter Council

The Chapter Council consisting of Mr. Franklin H. Bivins, Dr. R. R. Denslow, Dr. Byron L. West, Mr. Victor H. Turkington, Professor W. D. Turner, and Chapter officers Dr. Donald Price, Dr. E. H. Northey, Dr. Marston T. Hamlin, and Dr. Milton Burton, has held four meetings during the year. It has done excellent work in organizing and guiding the activities of the Chapter and in assisting the chairman in selecting the members of the various committees. Chairman Price and Chapter Representative Hamlin have kept the Council informed as to the activities of the National Committee on Professional Status.

Chapter Activities

During the 18th Chemical Exposition held at the Grand Central Palace in New York from December first to sixth, 1941, the Institute maintained a booth where members could stop to rest and chat during their tour of the Exposition, and where non-members received information concerning the Institute's purposes and activities. At least one member of the New York Chapter was always on duty to receive visitors during the entire six days of the Exposition.

It is to be regretted that in spite of the splendid efforts of the National Committee on Professional Status the Licensing Bill could not be reintroduced at Albany during the past legislative session. The failure to accomplish this end was due solely to the War, and the officers and members of the Chapter feel that this year there should be an early start in making all preparations for the introduction of the bill as early as possible in the next session of the New York Legislature.

Expenditures

Although the expenditures for the year have been in excess of many previous years, it is felt that this has been justified because of the increased publicity which our activities have received. Attention should again be called to the high quality of the announcements for the meetings prepared by Dr. F. W. Zons.

An Auditing Committee consisting

of Dr. Marston T. Hamlin and Mr. Franklin H. Bivins has been appointed to audit the books of the Secretary-Treasurer prior to the Annual Meeting.

Acknowledgment

The Chairman wishes to take this opportunity to express his appreciation to the officers, members of the Council, and Chairmen and Members of the Committees for their generous expenditure of time and effort to assure the Chapter a very successful year. He desires further to express his deep appreciation for the honor bestowed upon him by the New York Chapter.

Respectfully submitted,
Donald Price, Chairman.

Annual Report of the Pennsylvania Chapter
1941-1942

During the 1941-1942 season the Pennsylvania Chapter of the AMERICAN INSTITUTE OF CHEMISTS held six technical and professional meetings at Houston Hall, on the campus of the University of Pennsylvania. These meetings were preceded by dinner. The annual Social Gathering will be held on Saturday, May 23rd, and will take the form of a dinner and dance. The following is a list of meeting dates, speakers, and subjects presented during this past season:

1. October 28, 1941. Mr. J. A. Garvin of the Merck Company spoke on "The Chemical Situation Today".

2. November 25, 1941. Mr. H. W. Field of the Atlantic Refining Company spoke on "Chemical Hay for Flying Horses", a discussion of aviation gasoline in view of wartime demands.

3. January 27, 1942. Dr. John C. White of the Standard Oil (N.J.) Development Laboratories spoke on "Infra Red for Everyone".

4. February 24, 1942. Dr. Maximillian Ehrenstein of the U. of P. Medical School spoke on "Hormones of the Sex Glands and of the Adrenal Cortex".

5. March 31, 1942. Mr. Frank W. Bobb of the Pennsylvania Historical Society, Dr. Edward H. Riddle of Rohm and Haas, and Miss Marion P. Sykes of the Atlantic Refining Company participated in a symposium on "Library Aids to Research". This was a highly successful joint meeting with the Special Libraries Association of the Philadelphia area. It is planned to hold further joint meetings with various technical and professional associations.

6. April 28, 1942. Dr. Harry L. Fisher and Mr. Walter J. Murphy spoke on "Current Activities of the Institute". Mr. Murphy spoke on the "Influence of the War on Chemical Industry".

Abstracts of all these addresses have been, or will be, published in THE CHEMIST.

The plan, adopted last year, of having members of the local Chapter present short after-dinner talks on some phase of their industrial activity, was continued. After-dinner speakers were Mr. L. F. Tice of the Philadelphia College of Pharmacy and Science, Dr. William H. Gardner of the Brooklyn Polytechnic Institute, and Dr. Glenn Ullyot of Smith, Klein and French. A movie, entitled "The Land of the Aztecs", was shown at the October meeting.

The average dinner attendance was twenty, and the average meeting attendance, thirty-five.

At the April meeting, the following were elected to serve as officers beginning June 1: Chairman, Mr. J. M. McIlvain of the Atlantic Refining Company; Vice-Chairman, Dr. Maurice L. Moore of Sharp & Dohme; Secretary-Treasurer, Dr. Clinton W. MacMullen of Rohm and Haas; Reporter, Mr. Kenneth E. Shull of the Philadelphia Suburban Water Company; and Council Representative, Dr. Gilbert E. Seil of E. J. Lavino Company.

The Executive Committee has met regularly. Especial attention has been devoted to publicizing the Institute meetings in all the Academic and Industrial institutions in the area.

The Treasurer reported cash on hand, October 14, 1941, as $80.21, and on April 26, 1942, as $52.15.

Respectfully submitted,
Edward L. Haenisch, Chairman.

BOOKS

THIS CHEMICAL AGE. By Williams Haynes. *Alfred A. Knopf.* 1942. 6" x 9". 385 pp. $3.50.

To the average reader, the science of chemistry is a dry subject covered with the husks of unpronounceable names and unintelligible formulæ and, while he may have some consciousness of its application to his everyday needs, he has no conception of its importance.

It is a most difficult task to describe properly the histories of the transformation of these uninteresting and seemingly valueless things into the most interesting and valuable things of our physical existence in such a manner as to arrest the attention of those to whom a scientific treatise is something to be avoided.

In "This Chemical Age" the author, however, has presented to us the history of this science in the form of an entrancing drama in which the chemicals represent the heroes, the villains, the lovers who are endeavoring to become united, and the comedian who can turn the seeming tragedy into a comedy.

The ability of Williams Haynes to tell the story of chemistry in a popular, romantic and dramatic manner has been evidenced in his "Men, Money and Molecules," "Chemical Pioneers," "Sulphur" and "Chemical Economics" and in this latest book from his pen he tells the story of "The Miracle of Man-Made Materials" in a still more entrancing manner.

Here is the life history from conception to today of dyes, perfumes, synthetic textiles, paper, rubber, gasoline, glycerine, plastics, war materials and a score of other synthetic products of which chemistry is the mother and chemists the father. There are sixteen full-page illustrations in colors.

The author knows chemistry and the application of chemicals to commercial products, and his writing is clear, free from technical terms and punctuated with pertinent similes, resulting in a book of the deepest interest and widest information to every seeker of knowledge falling within the last five ages of Shakespeare's divisions of life's span.

Fortunately, or unfortunately, this reviewer has been reviewing books directed to the science of chemistry for more than thirty years, and he offers "This Chemical Age" to his readers as the most interesting book upon that subject that it has been his pleasure to review.

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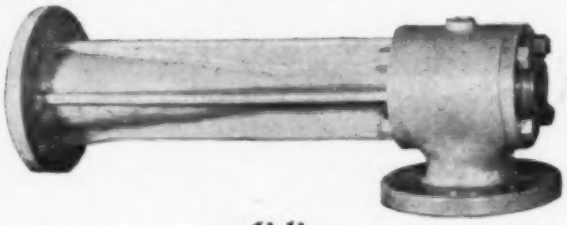

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